

## REMARKS

By this amendment, claims 1-7 are canceled and claims 11, 17, 18, and 21 are revised to place this application in condition for allowance. Claim 21 is revised to correct an informality and claims 11, 17, and 18 are revised since their independent claim has been canceled. Currently, claims 8-23 are before the Examiner for consideration on their merits.

In review, the Examiner has rejected independent claims 8 and 12 under 35 U.S.C. § 103(a) based on United States Patent No. 4,487,677 to Murphy. In the rejection, the Examiner alleges that the only difference between the invention as defined in these claims and the Murphy is the use of Ca as a reducing agent instead of Mg. The Examiner concludes that it would be obvious to one of ordinary skill in the art to substitute magnesium chloride with calcium chloride since they are functionally equivalent, citing col. 1, lines 11-17, of Murphy.

Applicants respectfully traverse the rejection on the grounds that the Examiner has oversimplified the issue of obviousness, and when considering all of the limitations of the claims, a *prima facie* case of obviousness is not established based on Murphy, regardless of the functional equivalency of Mg and Ca in making titanium.

First, the Examiner's attention is directed to the language in claim 8, which is as follows:

wherein, in electrolyzing as above, an alloy electrode made of a molten Ca alloy is employed for a cathode

The electrolyzing is described in claim 8 as follows:

a molten salt, being used for producing said Ti or Ti alloys and discharged from said reactor vessel, is electrolyzed to generate and replenish Ca in said molten salt which is returned to said reactor vessel

Claim 12 has a similar limitation regarding the use of a cathode as part of the electrolyzing step as follows:

a Ca generation step by electrolyzing, wherein a molten salt containing  $\text{CaCl}_2$  is electrolyzed by employing a molten Ca alloy as a cathode to increase a Ca content ratio in said molten Ca alloy

Common to each of these claims is that, in the cycle of reducing  $\text{Ti}_4\text{Cl}$  by Ca, a Ca alloy electrode is employed as part of the electrolyzing step. One issue of obviousness hinges on whether the steps of claims 8 and 12 in this regard are found in Murphy.

Turning back to the rejection, the Examiner has taken the position that the steps mentioned above are present in Murphy by contending that the only difference in the process of Murphy and that of claims 8 and 12 is the use of Mg instead of the use of Ca as specified in the claims.

Murphy relates to a method of producing Ti particles through the reduction of Mg. The method is characterized in that a molten salt of magnesium chloride is electrolyzed to form a magnesium chloride by-product. The by-product in the reduction reaction, where Mg is reacted with titanium tetrachloride, is recycled, thus producing magnesium and chlorine gas, which are used in the reduction reaction and in the chlorination step, respectively.

In rejecting the claims, the Examiner alleges that Murphy teaches electrolyzing a molten salt of magnesium chloride to produce magnesium, and further states "wherein the molten magnesium being a cathode."

Addressing the rejection of claim 8, this claim has specific language concerning a reduction step and a circulation type electrolysis step, wherein the electrolysis step further includes that the salt is discharged from the reactor vessel and is electrolyzed to generate and replenish Ca in the molten salt, which is returned to the reactor vessel, and wherein, in the electrolyzing, an alloy electrode made of a molten Ca alloy is employed for a cathode. The particular methodology, as explained in paragraphs [0042-0043] of Applicants' published patent application, enables back reaction, for example, to be prevented, whereby various effects such as preventing a decrease in electrical efficiency can be exhibited.

The rejection says nothing about these particular steps nor identifies the basis in Murphy to allege that these steps are taught or present. In fact, the steps found in claim 8 are not disclosed in Murphy and a *prima facie* case of obviousness cannot be established by this reference.

Moreover, the mere fact that Ca could be considered a replacement reductant for the magnesium employed in Murphy does not render claim 8 obvious under 35 U.S.C. § 103(a). This is because the invention of claim 8 is more than the mere modification of the process of Murphy by the use of Ca instead of Mg. Claim 8 recites a specific series of steps, including "in the electrolyzing, an alloy electrode made of a molten Ca alloy is employed for a

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cathode", which is missing in its entirety in Murphy. Consequently, the rejection as applied to claim 8 and its dependent claims must be withdrawn.

The same argument made above applies to independent claim 12. As noted above, claim 12 includes the step of generating Ca by electrolyzing wherein a molten salt containing  $\text{CaCl}_2$  is electrolyzed by employing a molten Ca alloy cathode to increase a Ca content ration in the molten Ca alloy.

The rejection says nothing about this step in alleging obviousness. In fact, Murphy does not teach such a step and the rejection must be withdrawn. If the Examiner should maintain the rejection, the Examiner is called upon to specifically point out by column and line number the basis for alleging that the Ca generation step of claim 12 is suggested in Murphy.

Again, even if Murphy were modified such that Ca was used in place of Mg to produce the titanium particles, this change still fails to teach the step of claim 12 at issue and a *prima facie* case of obviousness is not established.

Since claim 12 is patentable over Murphy, its dependent claims are also in condition for allowance.

Turning now to the double patenting rejections, the rejection of claims 1-7 is rendered moot by their cancellation.

The double patenting rejection of the remaining claims is traversed on the grounds that the Examiner has not established that the claims are obvious based on the claims of the co-pending application no. 10/575,225. In the rejection, the Examiner admits that the claims of the co-pending

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application do not disclose "the electrode configuration" but contends that Murphy somehow teaches that the present claims are obvious when the co-pending application and Murphy are combined.

The double patenting rejection as applied to claims 8-23 is improper since the Examiner does not have a basis to modify the co-pending application so as to arrive at the invention. As explained above, Murphy does not teach the invention of claims 8 or 12. Therefore, using the teachings of Murphy with the co-pending application still fails to produce the invention of claims 8 and 12. Therefore, the obviousness-type double patenting rejection must be withdrawn.

To recap, the rejection of claims 8-23 is improper since Murphy fails to teach the claim limitations regarding the molten Ca alloy cathode. In addition, the obviousness-type double patenting rejection must be withdrawn since Murphy does not provide a basis from which to allege that the invention is an obvious variation of the claims of the co-pending application.

In light of the above, the Examiner is respectfully requested to examine this application and pass all pending claims onto issuance.

If the Examiner believes that an interview would be helpful in expediting the allowance of this application, the Examiner is requested to telephone the undersigned at 202-835-1753.

The above constitutes a complete response to all issues raised in the Office Action dated June 5, 2008.

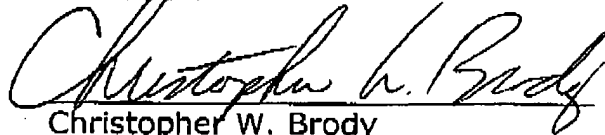
Again, reconsideration and allowance of this application is respectfully

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requested.

Applicants respectfully submit that there is no fee required for this submission, however, please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-1088.

Respectfully submitted,  
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